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Bio: Danyang Zheng received the Ph.D. degree in computer science from the Georgia State University, GA, USA in 2021. He is currently an associate professor at Southwest Jiaotong University, China. His research interests include network function virtualization, software-defined networks, networking performance optimization and combinational optimization.

Speech Title: Energy-Efficient In-network Computing at Mobile Edge networks

Speech Abstract: Mobile edge networks combine the advantages of cloud, edge, and mobile networks bringing high computing capacity with low latency to mobile users at the network edge. With mobile edge networks, users can now conveniently offload their computation tasks to the servers along the data flow, which is also known as in-network computing (INC). With INC in mobile edge networks, the base station collects the computing-intensive demand (tasks) from mobile users under its coverage and offloads the demand to the edge server, which is composed of multiple racks and deployed at the network edge. One essential problem in INC of mobile edge networks is how to satisfy the computing demand for mobile users while minimizing the energy consumption of the edge servers. The existing work usually assumes that all racks in the edge server are active. Since a nontrivial amount of idle racks (active but not working) consume energy, in this paper, we for the first time comprehensively consider the rack energy consumption and formulate the problem of Energy efficient Rack working state Assignment in INC of mobile edge networks (ERAM) via the technique of Integer Linear Programming (ILP). We propose an efficient heuristic algorithm called Offloading-Efficiency based Rack working state Assignment (OERA). We prove that OERA guarantees an $\ln(n)+1$ -approximation upper boundary. Our extensive experiments and analysis show that the proposed algorithm significantly outperforms the benchmarks.